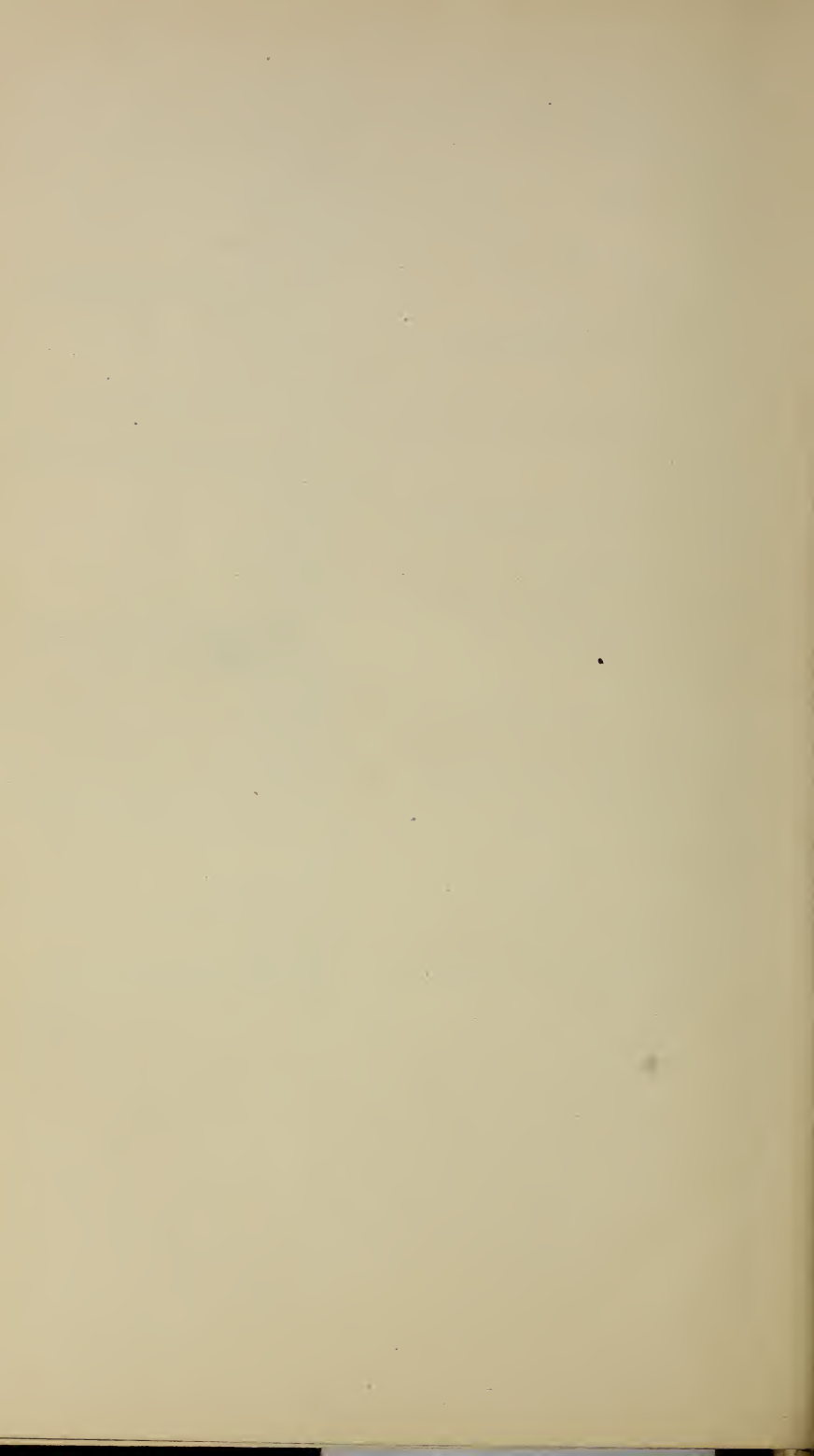


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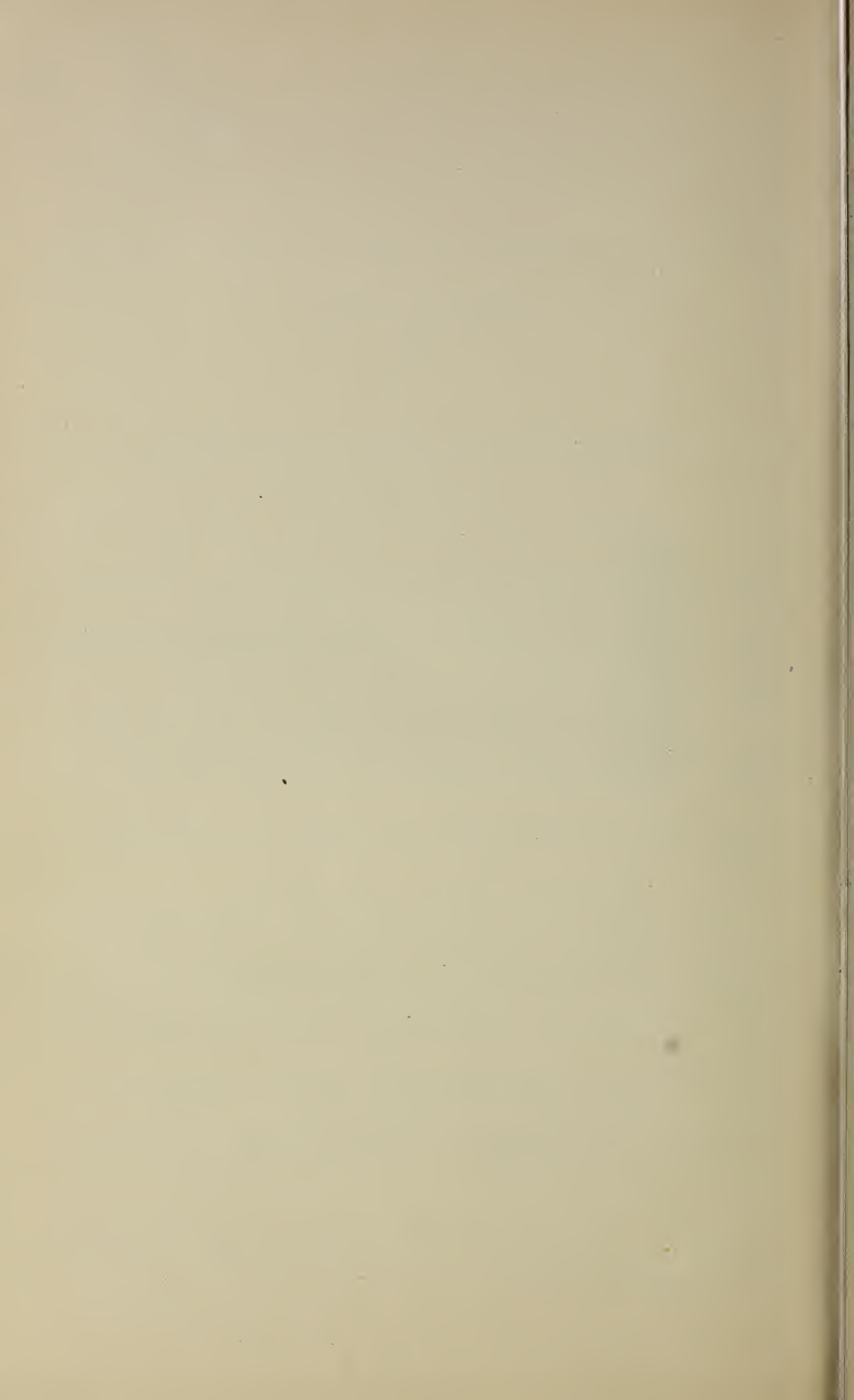
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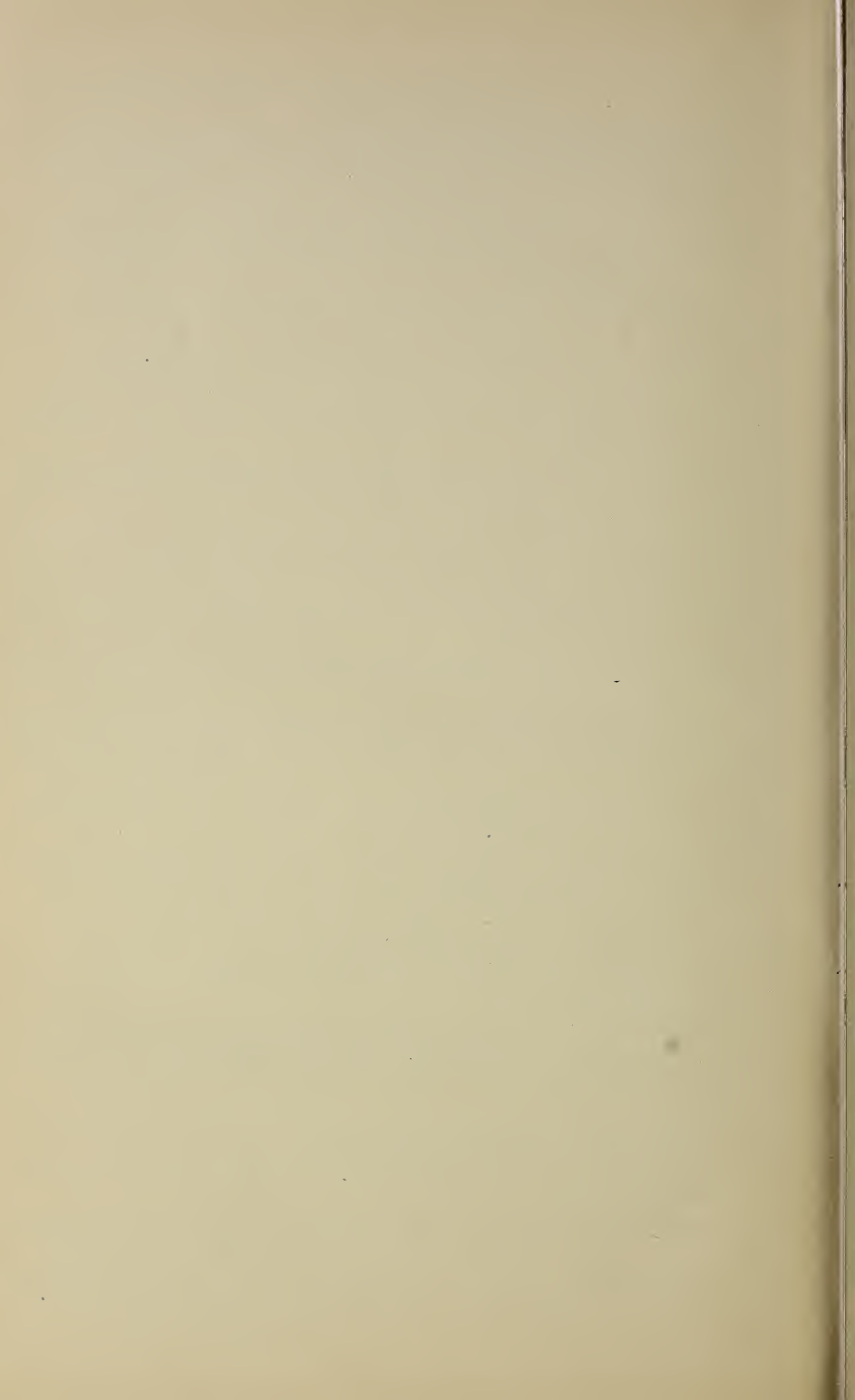
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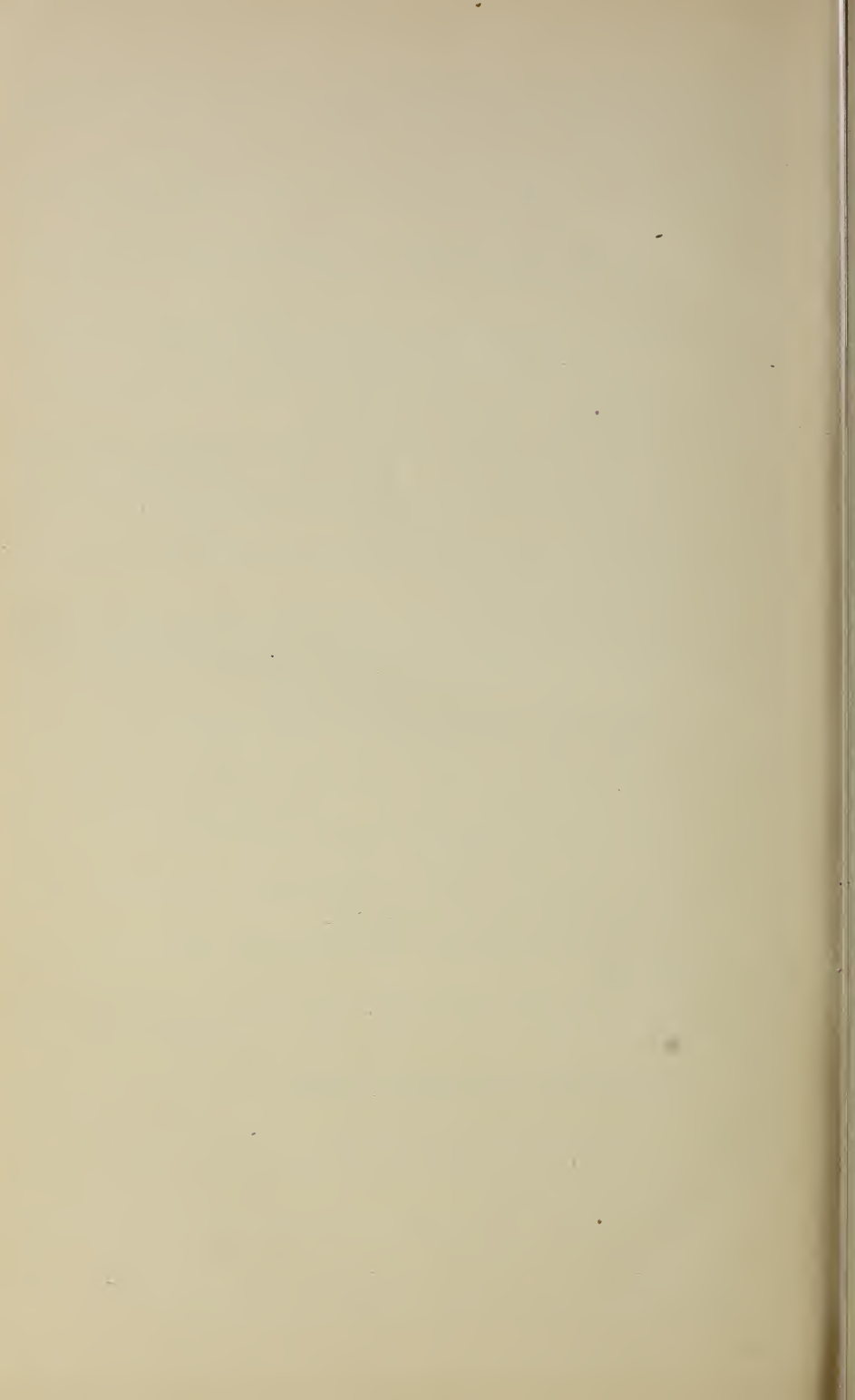
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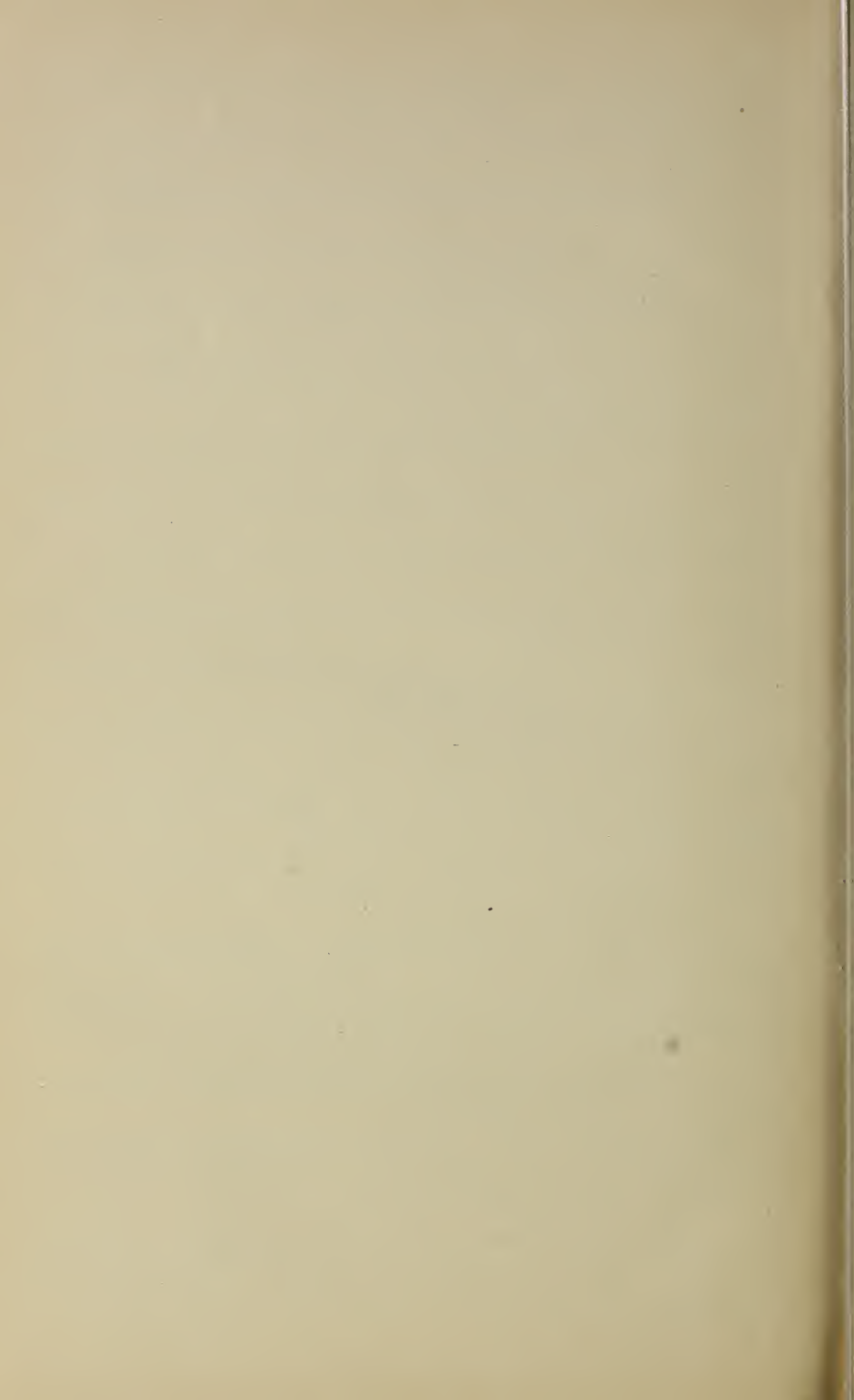
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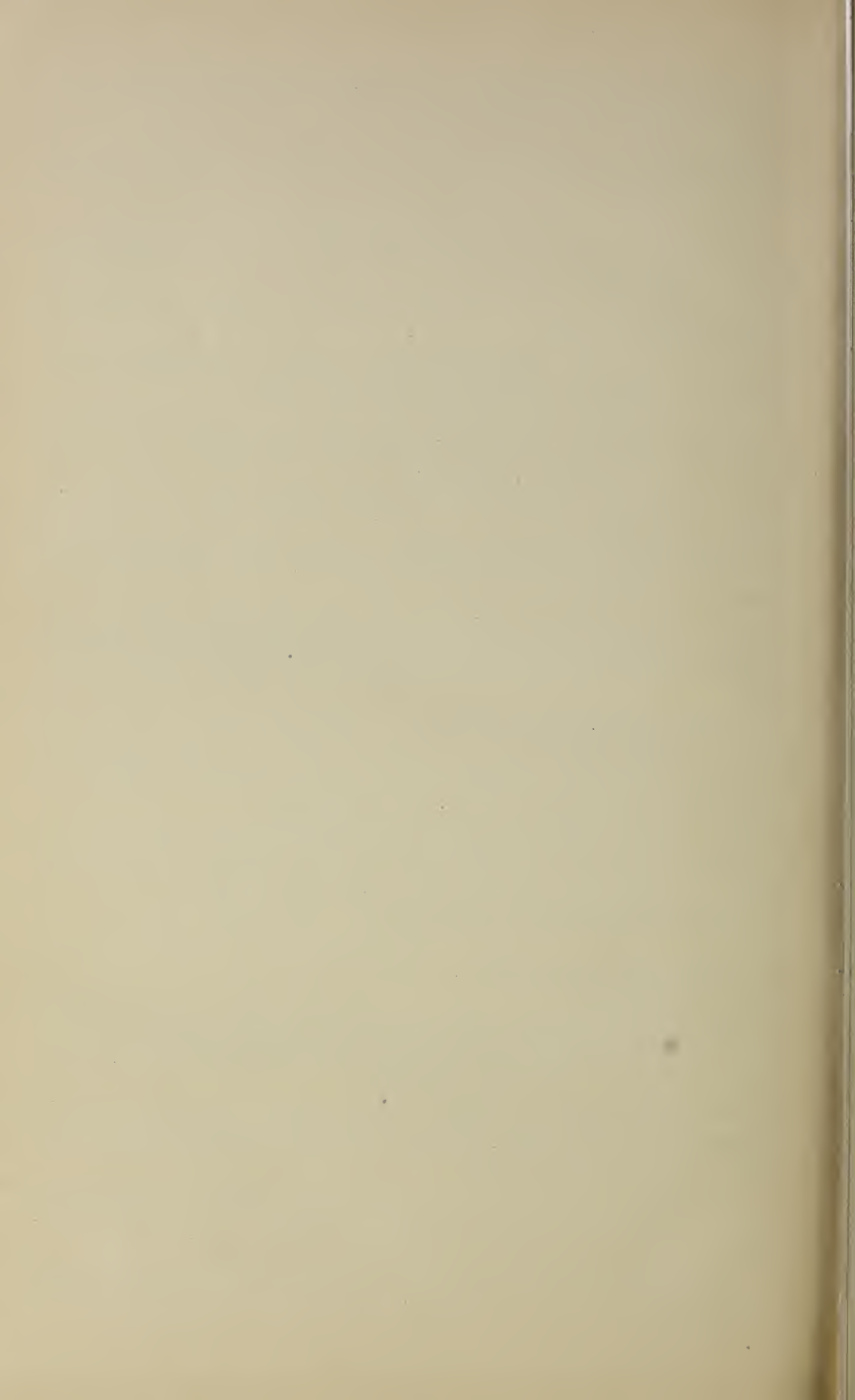
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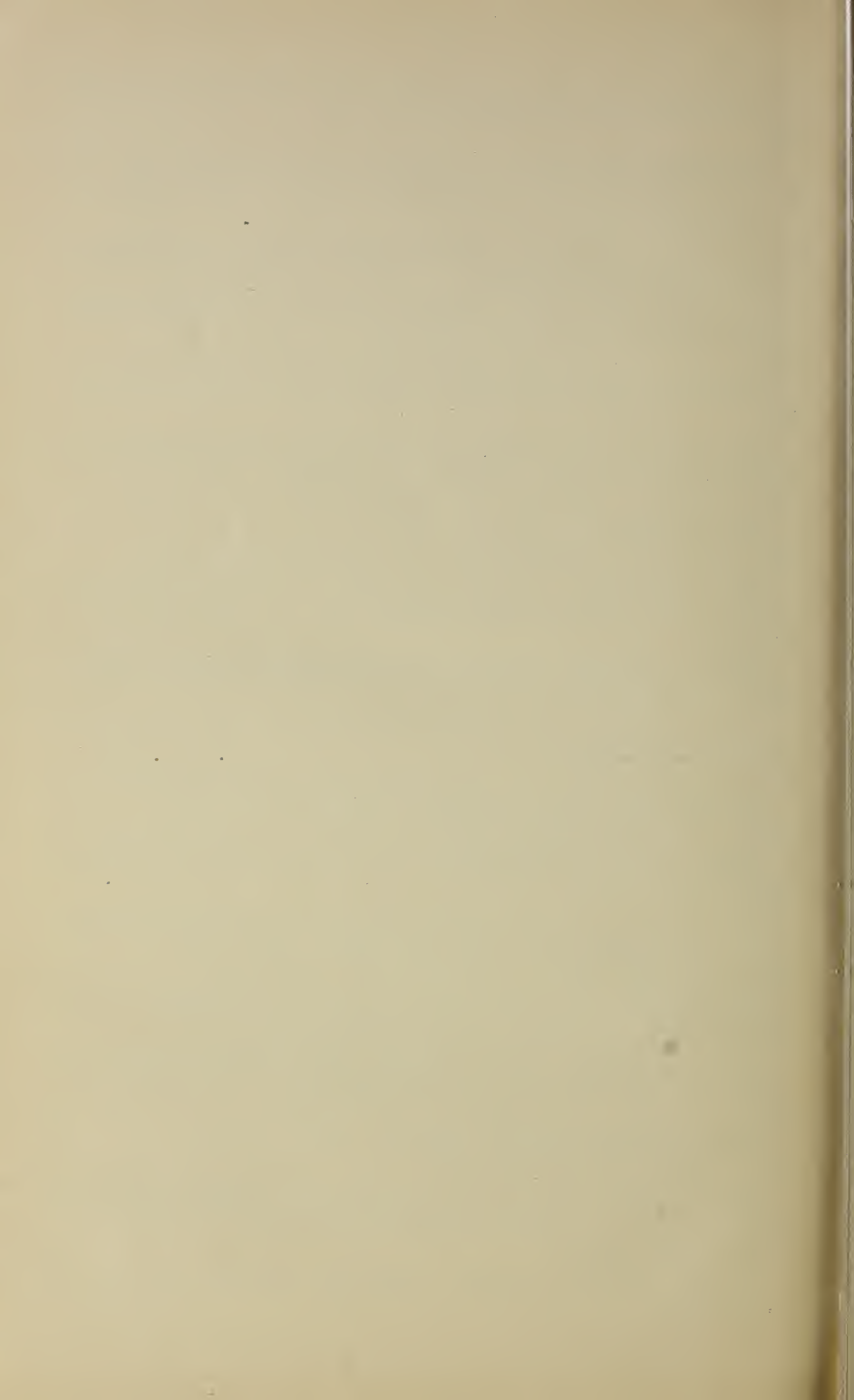
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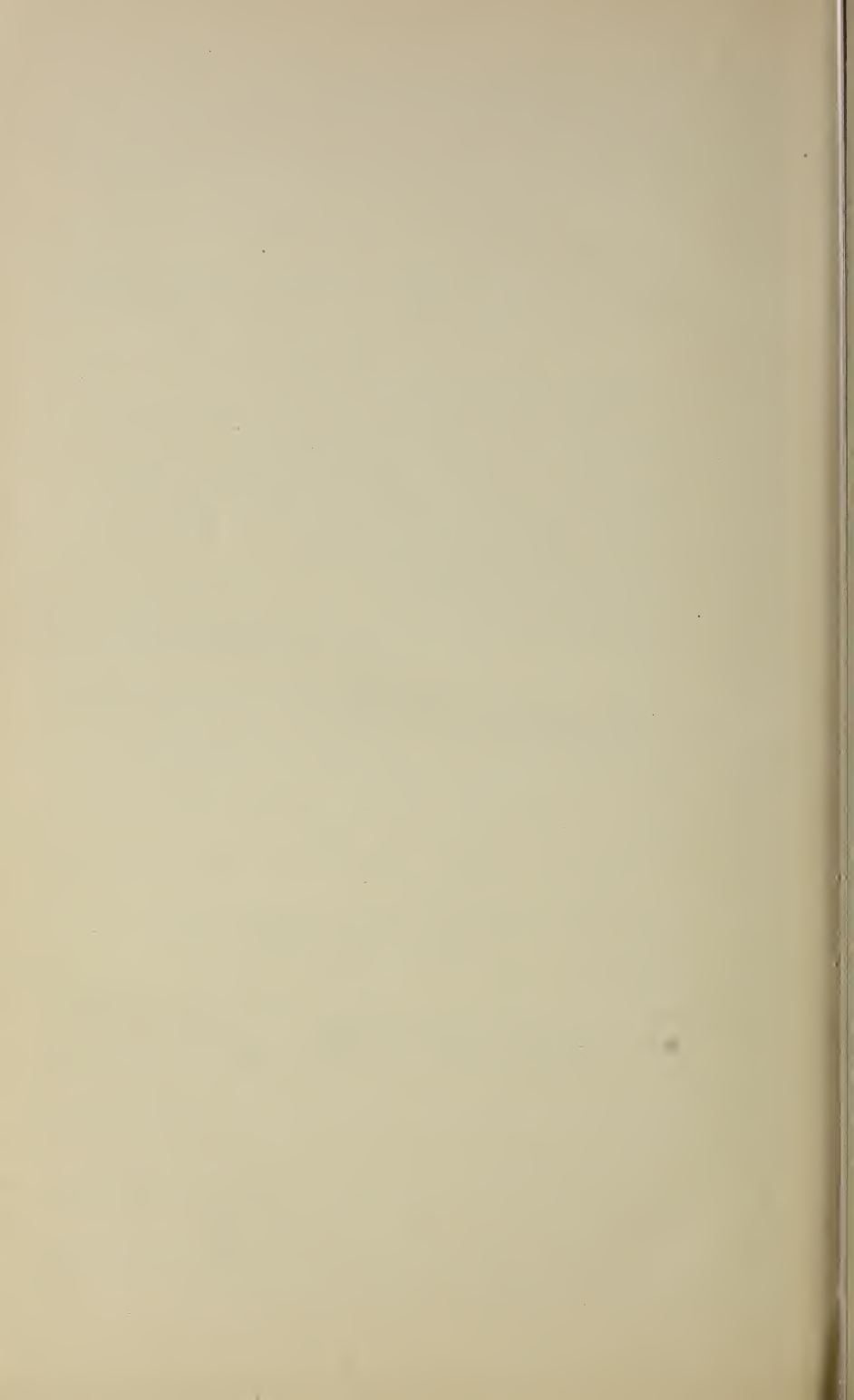
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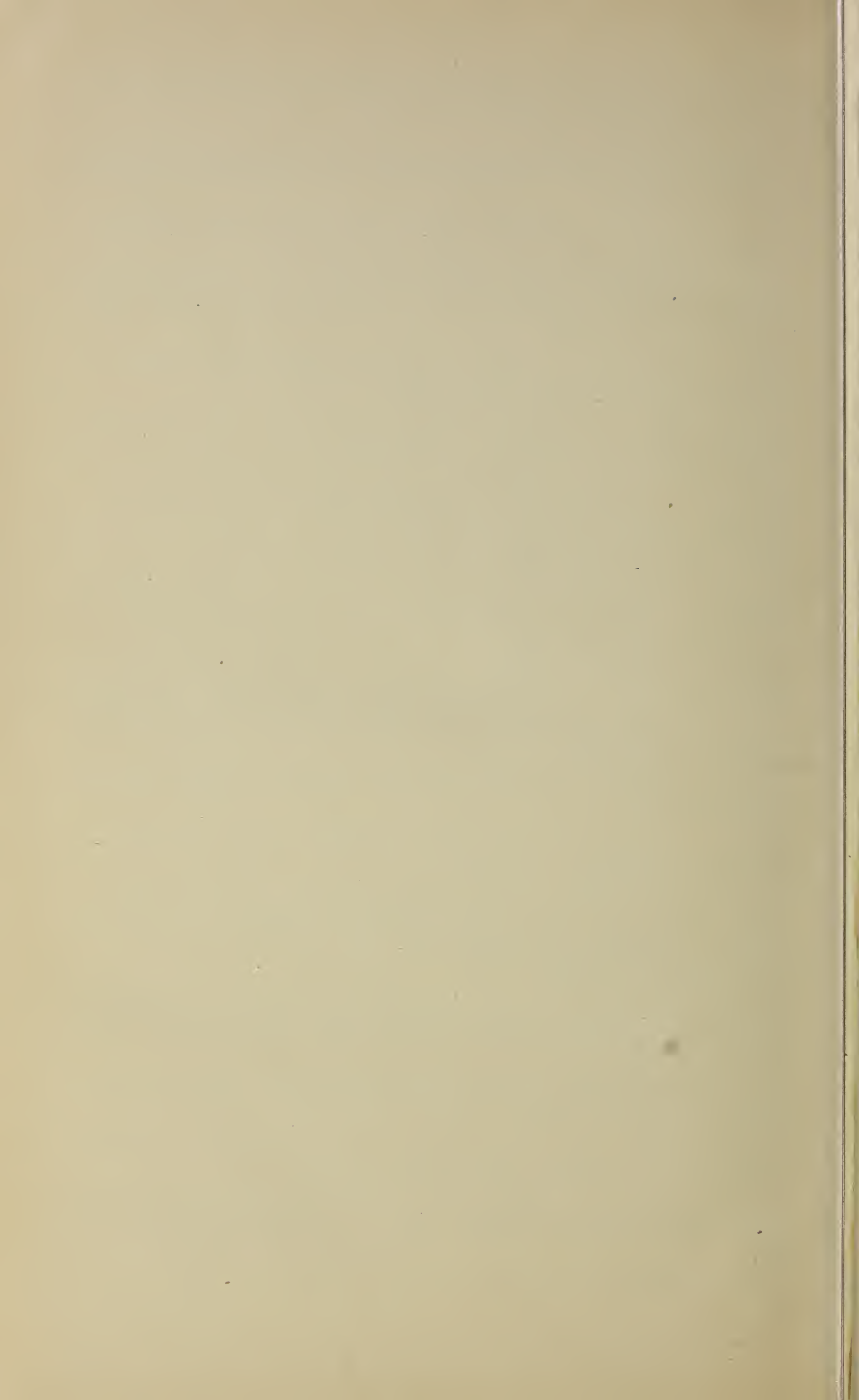
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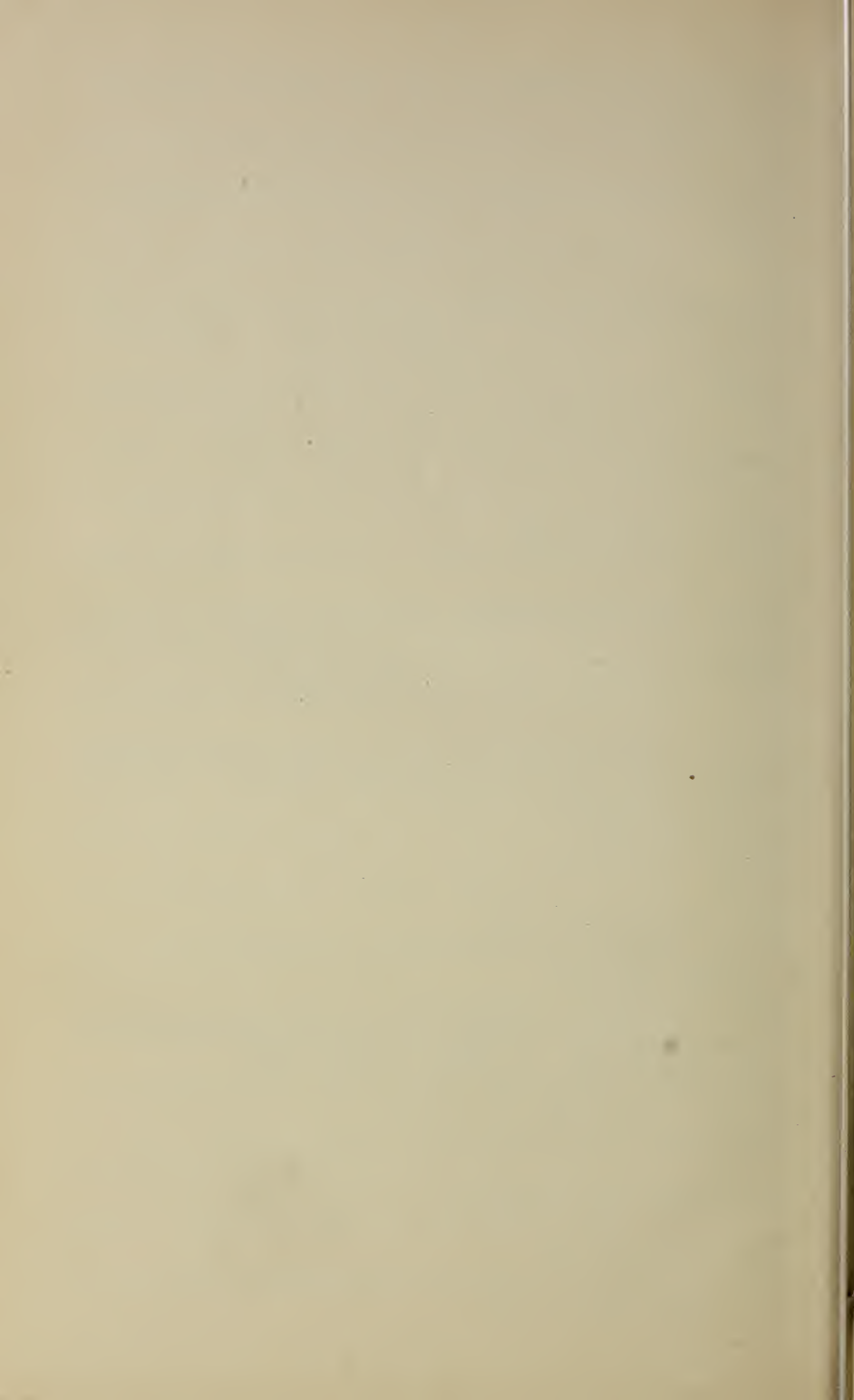
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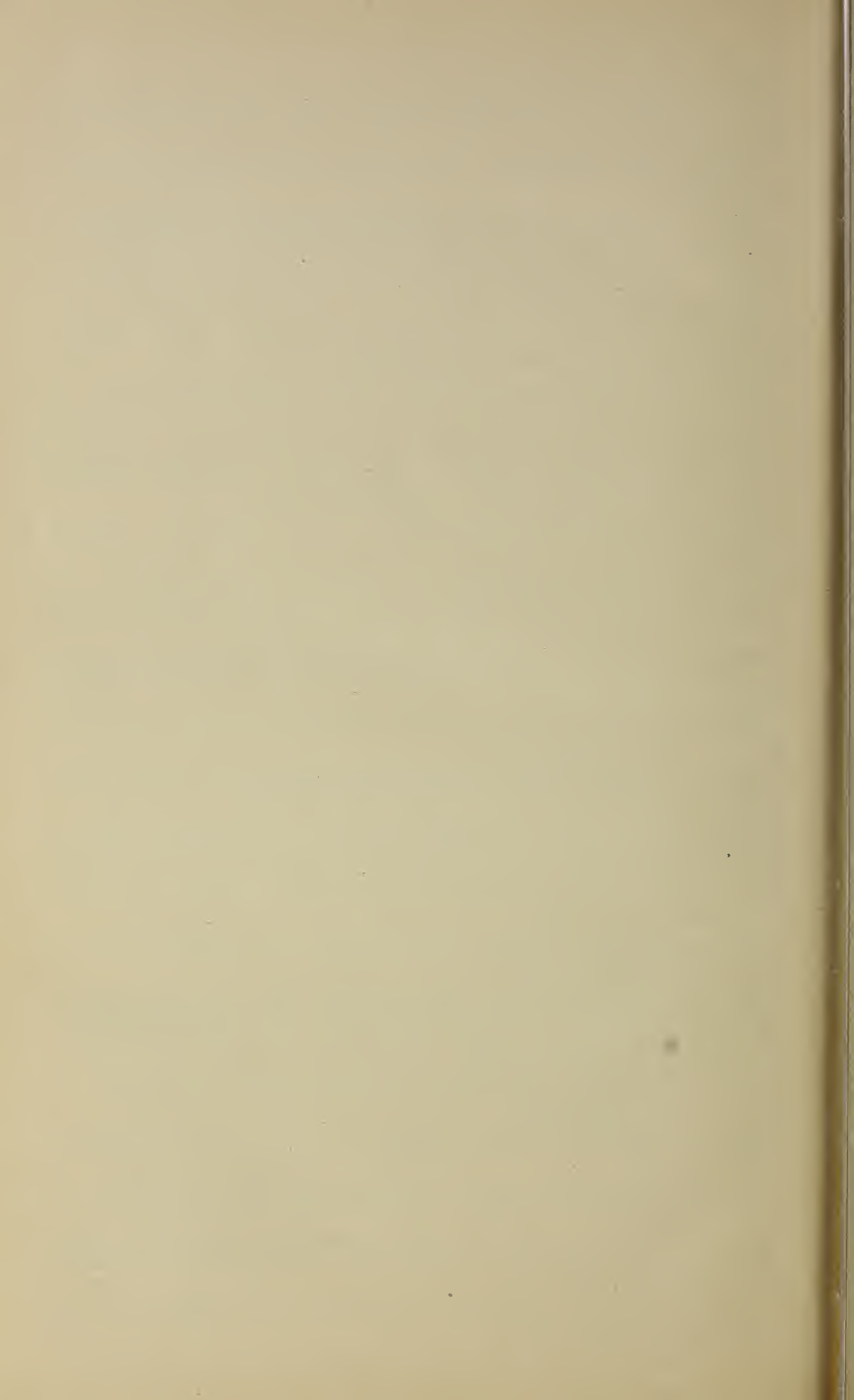
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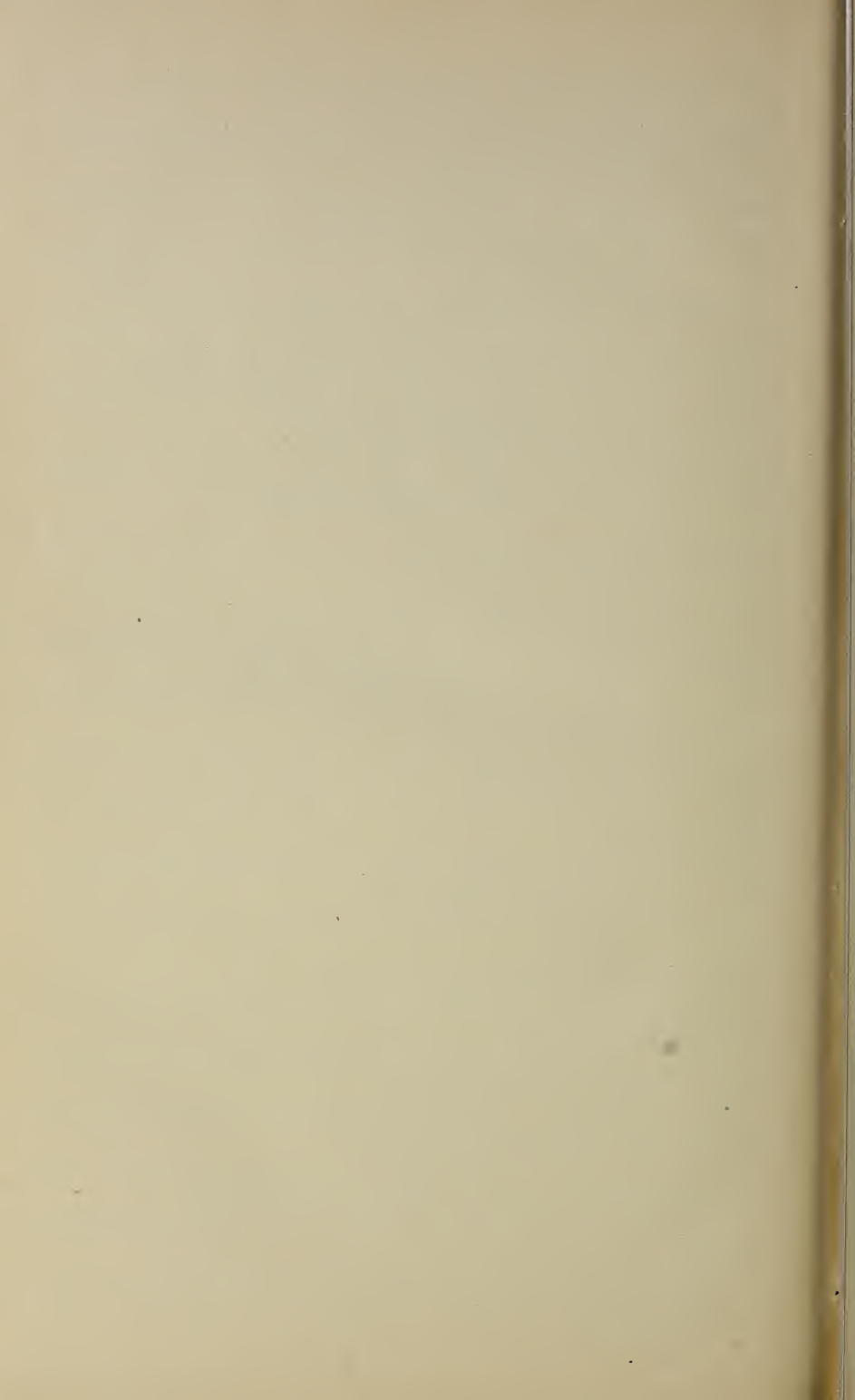
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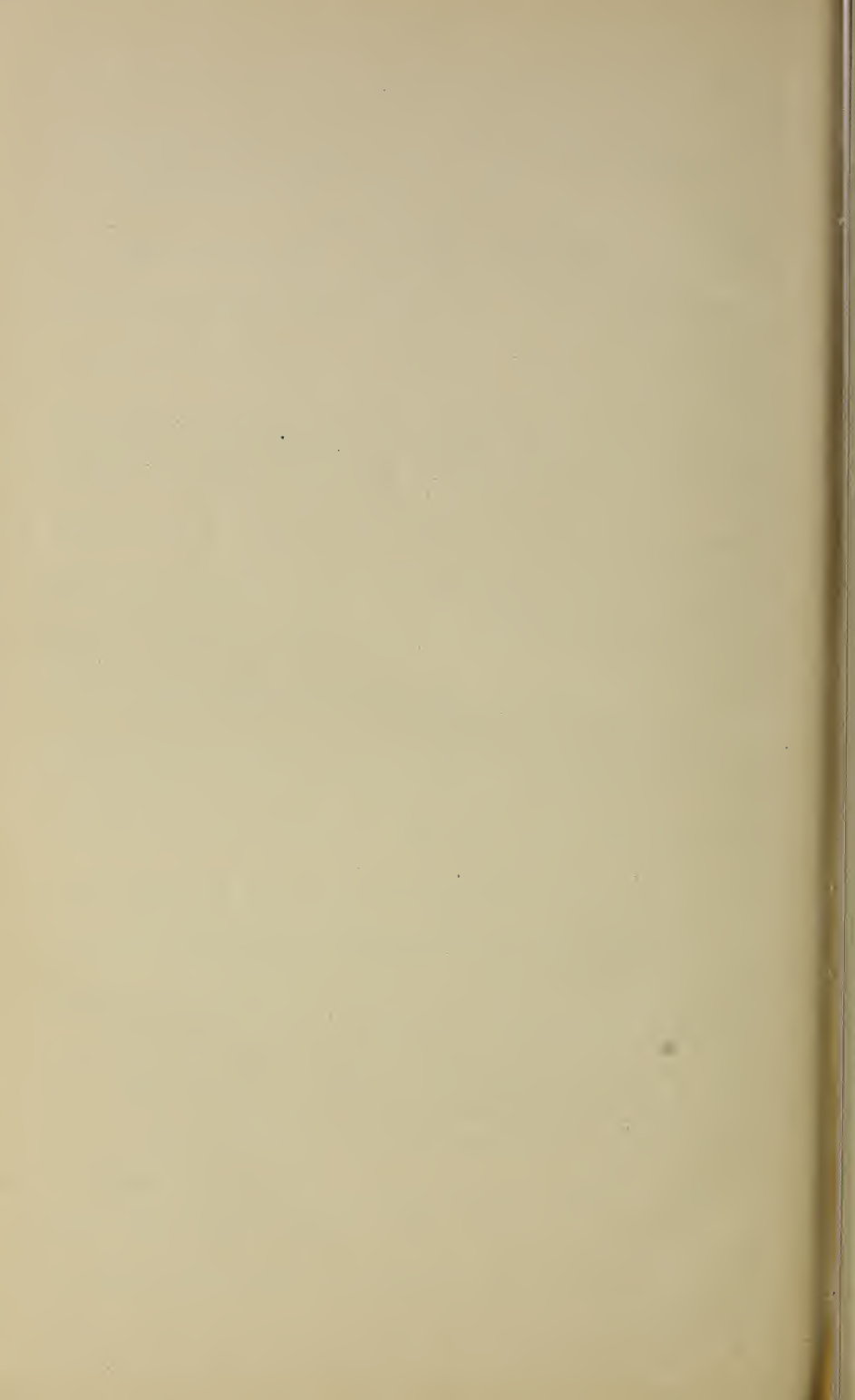
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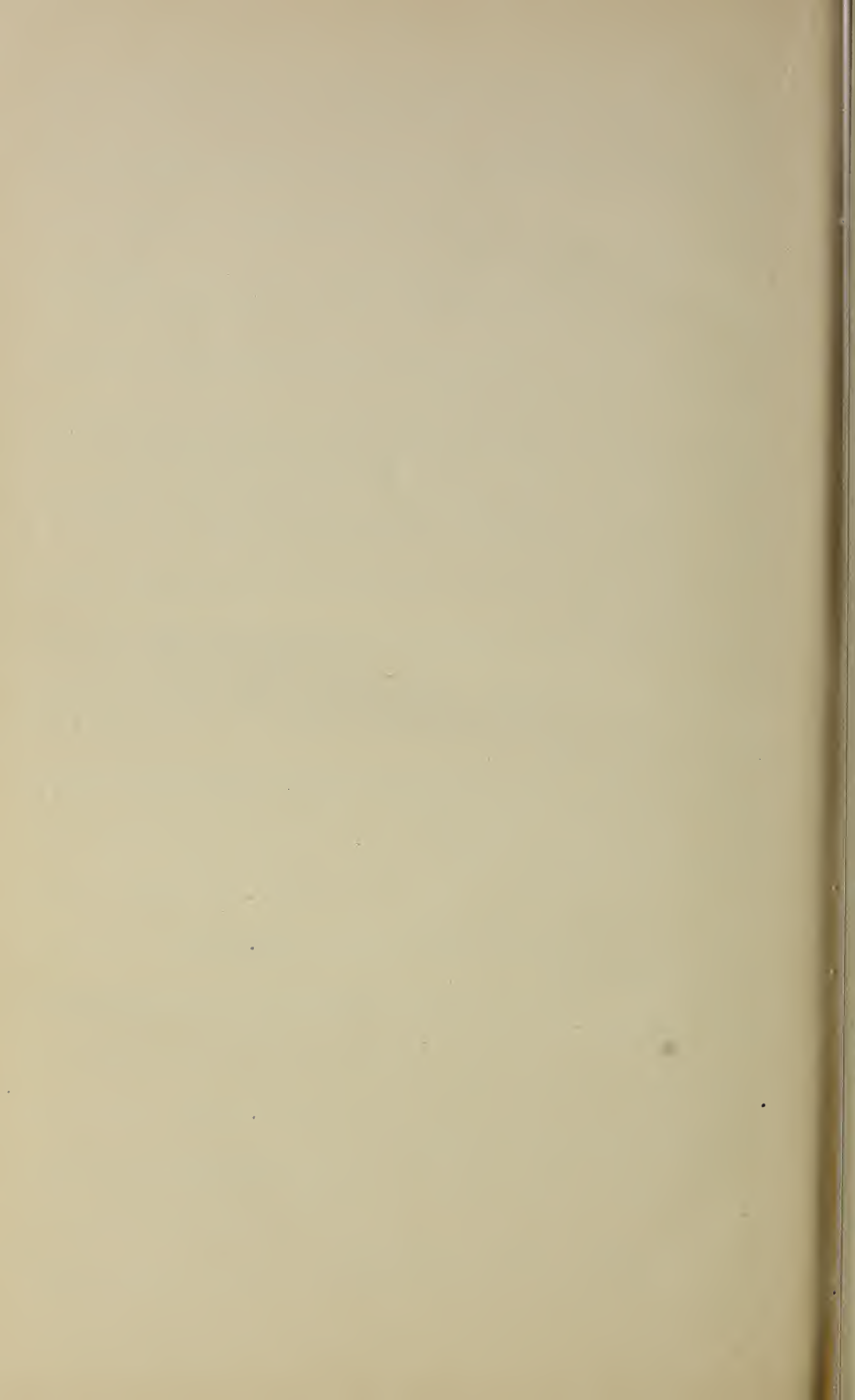
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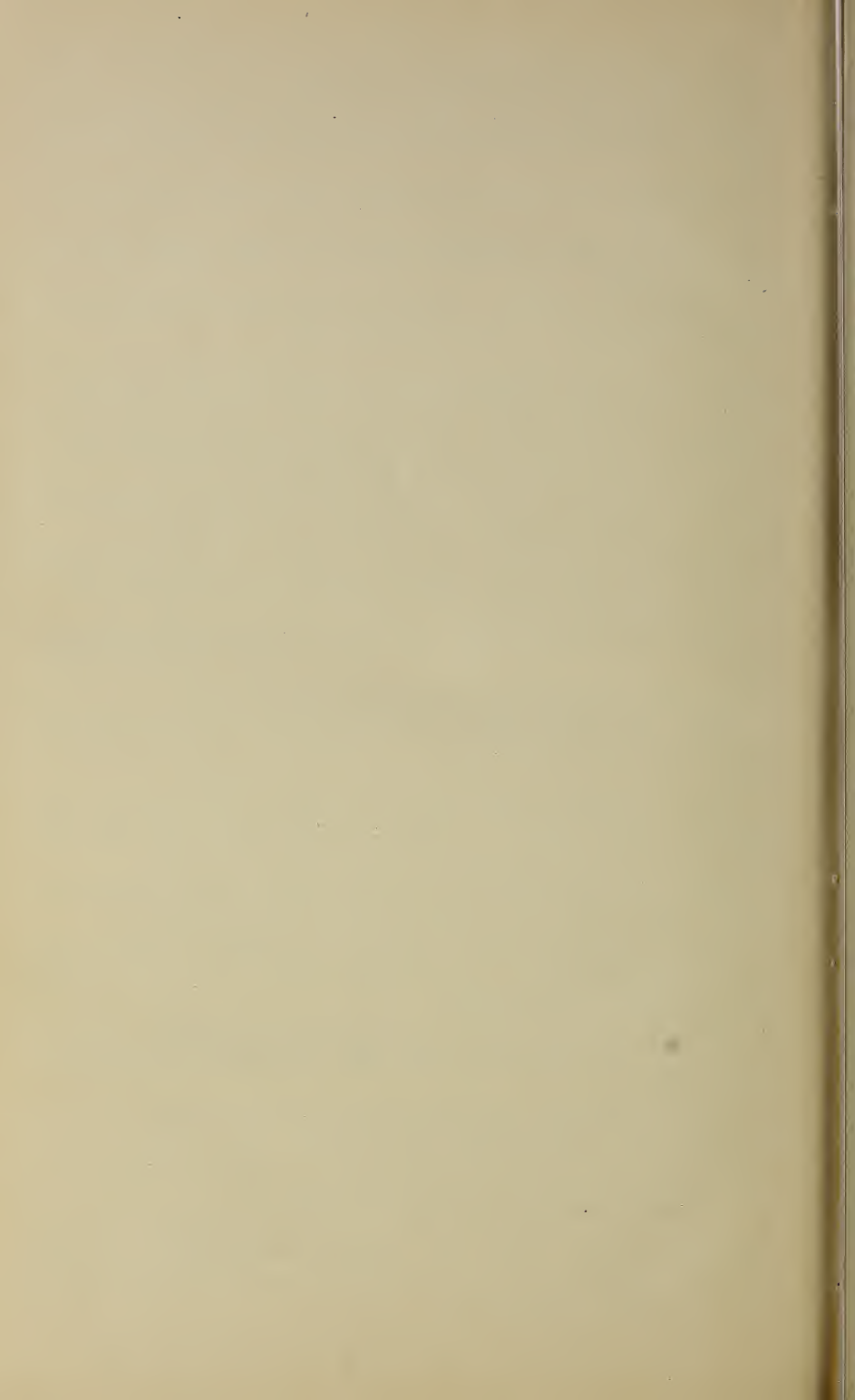
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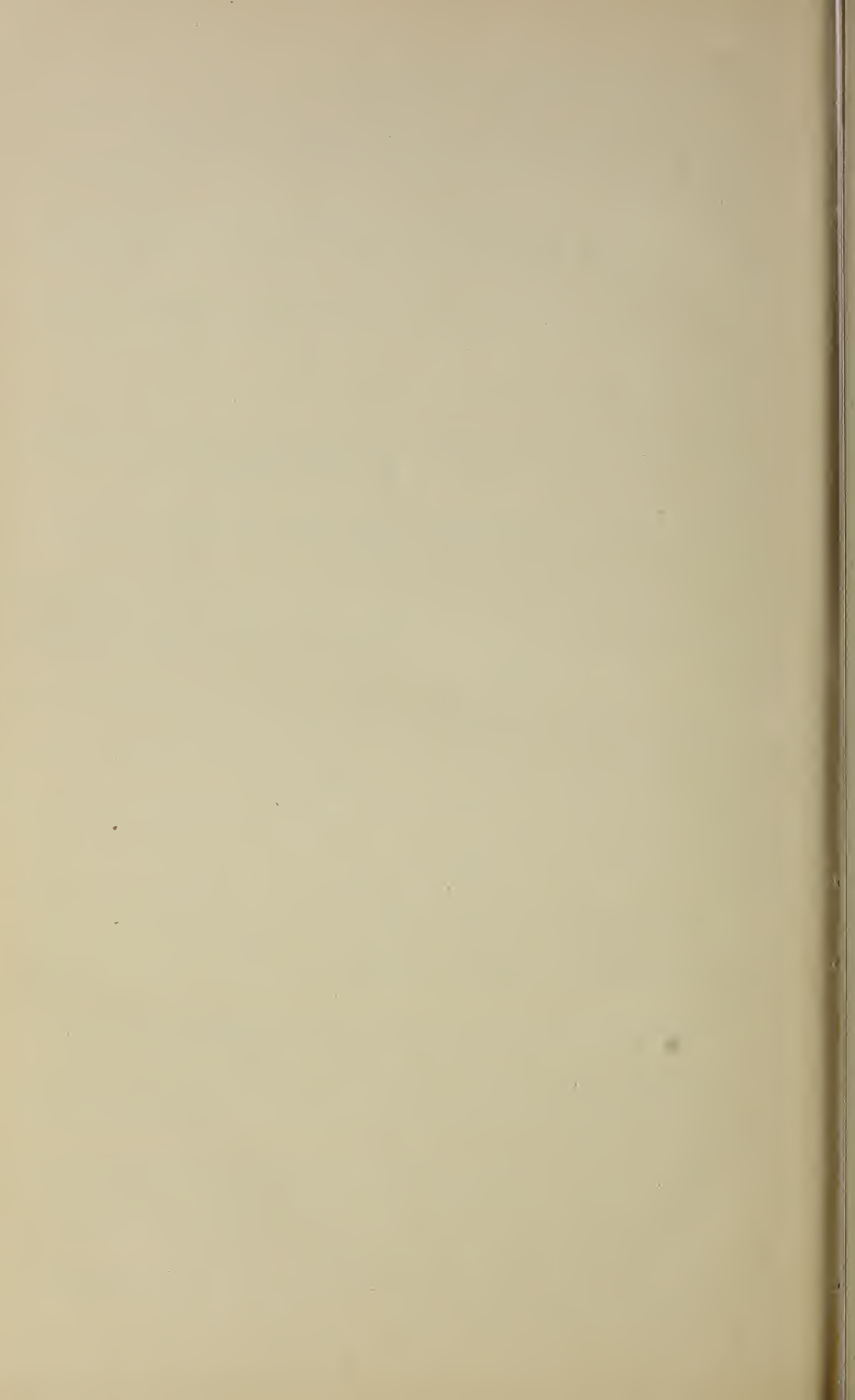
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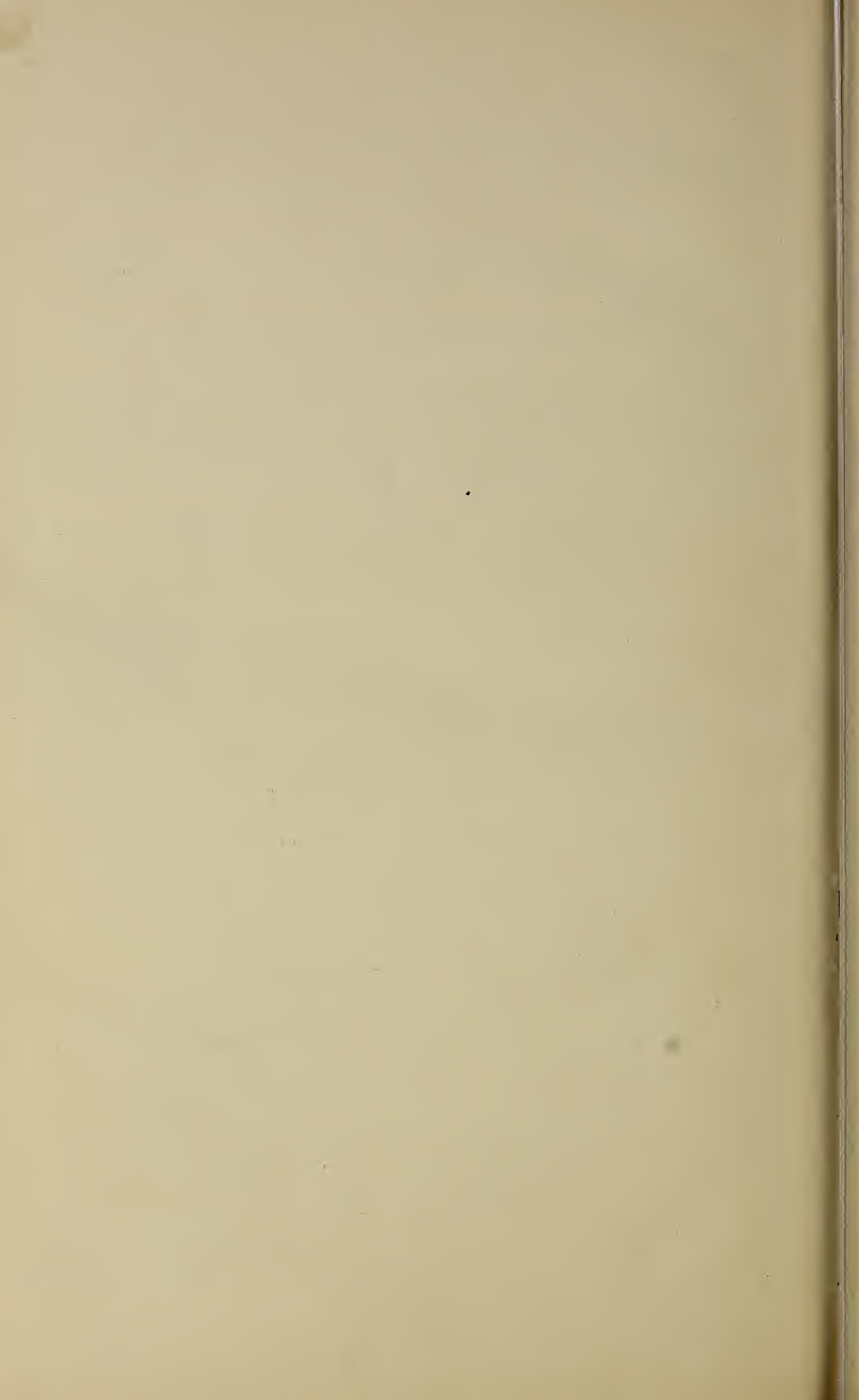
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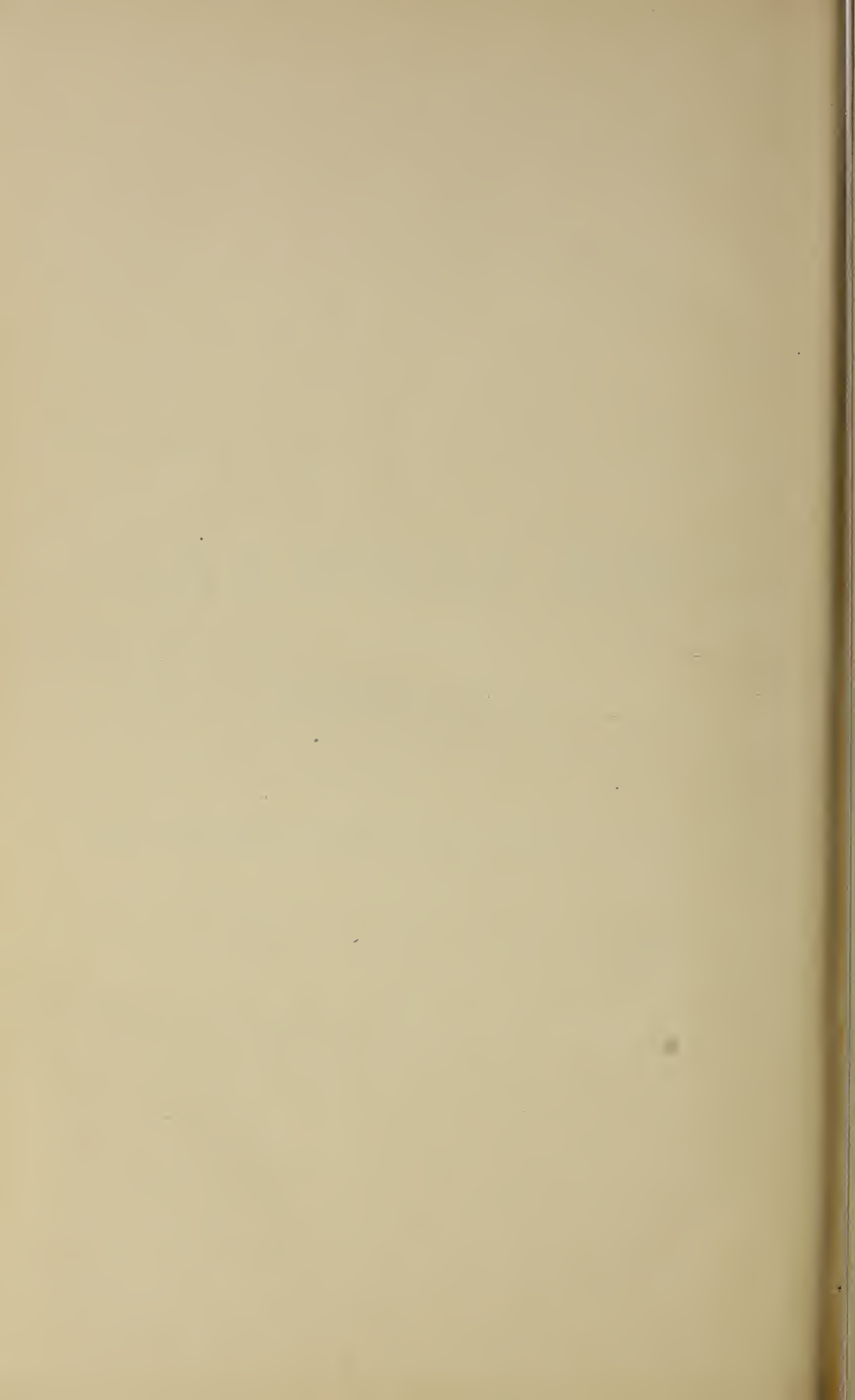


THE LIBRARY.

BY

W. P. CUTTER,
Librarian.

REPRINT FROM YEARBOOK OF DEPARTMENT OF AGRICULTURE FOR 1897.



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WORK OF THE DEPARTMENT FOR THE FARMER.

The papers in the Yearbook under the above heading were prepared by special direction of the Secretary of Agriculture in accordance with the instructions contained in the following letter, a copy of which was addressed to the chiefs of the various bureaus, divisions, and offices, "outside of those that are purely administrative:"

U. S. DEPARTMENT OF AGRICULTURE,
OFFICE OF THE SECRETARY,
Washington, D. C., September 18, 1897.

SIR: It is my desire that, in addition to such other suitable articles as may be necessary, the forthcoming Yearbook, 1897, should contain an article from each chief of bureau, division, and office outside of those that are purely administrative, which shall set forth in plain terms the relation of the work of his bureau, division, or office to the farmer. The existence of the Department is justified precisely so far as it aids the farmer to be a successful farmer, and my desire is that the article called for should present clearly to the reader just how the division of the work in your charge achieves that purpose. Let it be such a paper as you would prepare to present to a body of farmers of average intelligence, or before a committee of Congress inquiring into the purpose, character, and practical utility of your work.

* * * * *

Very respectfully,

JAMES WILSON, *Secretary.*

THE LIBRARY.

By W. P. CUTTER, *Librarian.*

INTRODUCTION.

In 1868, the building for the then recently created Department of Agriculture having been completed, the books on agricultural subjects which had been collected by the Division of Agriculture when part of the Patent Office were transferred to rooms set apart for them in the new Department building. Since that time varying amounts have been appropriated for the purchase of books and periodicals and for the employment of a librarian and assistants. The Library has

grown from the collection of less than 1,000 volumes when transferred to one of nearly 59,000 volumes, and from the few bookcases in the office of the first Commissioner of Agriculture, has spread out to such an extent as to require the largest room in the Department building and a considerable amount of shelf room in every division of the Department. There are books in nearly every modern language, and publications are received from every civilized nation.

AMERICAN AND FOREIGN AGRICULTURAL PUBLICATIONS.

Of American agricultural publications, the Library has complete sets of those issued by State boards of agriculture and agricultural societies and of the bulletins and reports of the agricultural experiment stations. There are sets of many of the American agricultural journals, and the current issues are preserved and bound for future use. There are many volumes of the publications of local agricultural societies and organizations of similar character. Of separate books on agriculture, the Library has as complete a collection as may be found anywhere. Especial care has been taken to add to this collection at every opportunity, but it is seldom that an American book on agriculture is offered for sale that is not already on the shelves of the Library.

An attempt has been made to obtain the chief publications of foreign countries on agricultural subjects. The official publications of these countries are regularly received and preserved, and numerous agricultural papers and journals from all over the world are on file. The total number of volumes on purely agricultural subjects in the Library is about 12,500.

IMPORTANT COLLECTIONS ON AGRICULTURE.

Some special features of the agricultural section are of interest. The Library has a very complete set of the registers (herd books) of blooded stock published by the various live-stock societies in the United States and foreign countries. An especial effort has been made to obtain a complete collection of publications relating to poultry. There are more than 100 separate volumes treating of the history, culture, and commerce of tobacco, and special treatises on uncommon agricultural crops are numerous. In every special branch of agriculture an endeavor is made to add every work of importance and to keep serial publications complete and up to date.

The collection of books on horticulture, forestry, and landscape gardening comprises about 8,000 volumes, and is as varied and complete in its composition as the agricultural section. Of especial interest is the Von Baur library of forestry recently purchased. This is a collection of about 1,700 volumes in the German language, comprising complete sets of the various forestry periodicals and copies of every important German work on forestry.

The Library has a notable collection of works on agricultural and general statistics, including the official statistical reports of all the prominent European countries, and a number of yearbooks, periodicals, and separate works. These are supplemented by the official publications of the various States of the Union, dealing with such subjects as population, economic resources, health, labor, and charities, and by an important collection of the laws of the various States as included in their compiled statutes and the subsequent session laws. This portion of the Library numbers about 10,000 volumes.

BOOKS OF GENERAL REFERENCE AND NATURAL SCIENCE.

The Library contains a large number of works of general reference, such as encyclopedias, directories, dictionaries of the various languages, atlases, gazetteers, and dictionaries of biography and history. There are also a number of volumes of travel, especially those including scientific or economical descriptions of the countries visited. A few standard historical works and about 250 volumes of general literature make up the total of 2,500 volumes in this section.

The remainder of the Library, some 20,000 volumes, may be classified as natural science, and includes working reference libraries in chemistry, physics, zoology, and botany, with the works in general science, including periodical publications. The science section is especially noteworthy for its completeness in the line of periodical literature. There are sets of all the important journals used for reference by scientific workers, and the Library subscribes to more than 300 periodicals for their use.

There is in the Library a fairly complete set of the publications of the United States Government, especial prominence being given to such as contain matter of agricultural, statistical, or scientific interest.

USEFULNESS OF THE LIBRARY.

The influence of the Library of the Department on the general welfare of the farming community may at first glance seem very slight, yet, on more careful investigation it will become evident that this influence, although indirect, is greater than might be supposed. The Library, being as it is in the foremost rank of the agricultural libraries of the world, is a storehouse for printed knowledge on agricultural subjects, and as such serves to preserve for the workers of the future the literature of the present and the past. The value of books to the farmer is becoming more and more evident. Of course, it is impossible for many of the farmers of the country to come to Washington to consult the Library, but it is possible for the information stored in the Library to reach the farmer in an indirect manner. In the preparation of the publications of the Department, especially those of direct interest to the farming community, the collection in

the Library assists by giving the printed opinions and the results of the experience of past investigators all over the world, and thus serves as a guide to the compiler of such publications. Through its relations with the agricultural experiment stations and colleges, the Library is attempting to be of assistance to those workers in agricultural science who are located nearer the farmer and are thus familiar with his interests.

But the Library is especially useful indirectly to the agricultural community through the assistance rendered to the scientific workers in the Department in connection with their researches. Little work can be accomplished in scientific investigation without access to the literature of the subject investigated and a careful search after the truth as discovered by previous investigators. On the organization of a new line of research in the Department, the first demand is almost invariably for books and periodical literature. The preparation of statistical bulletins, especially those which relate to the crops and markets of other countries, would be almost impossible without access to the literature relating to these countries. The identification of useful plants, of weeds and noxious insects, of plant and animal diseases, depends largely on the examination and study of the printed observations of other workers. The work of the Department in the publication of the Experiment Station Record deals almost entirely with the literature of agriculture and the allied sciences. Indeed, a careful examination of the work of any of the scientific and technical work of the Department will reveal the large dependence on the collections of the Library in the daily work.

DISTRIBUTION OF PUBLICATIONS TO LIBRARIES.

The Librarian has charge of the distribution of the publications of the Department to the college and public libraries of the United States, and particular care has been taken to have a complete set of these publications available for reference in the libraries of the country, so that students of agriculture, wherever located, may be able to consult them within a short distance of their homes. Arrangements are also made to place the publications in numerous libraries throughout the civilized world, in order that the inhabitants of foreign countries may be able to follow the operations of the Department, and thus keep in touch with the agricultural methods in vogue in this country.

CONTRIBUTIONS TO AGRICULTURAL LITERATURE.

As a contribution to the knowledge of the literature of agriculture, accurate lists of the various sources of information on specific agricultural subjects have been published, and others are in course of preparation. These lists are finding ready acceptance among workers in agricultural investigation, and have called forth much favorable

comment. There is now in course of preparation a list of the best publications covering the whole field of agriculture, and it is the intention in the near future to prepare suitable printed indexes to the main authorities on agricultural subjects, to serve as a partial guide to students and teachers of agriculture. Questions as to the best books on certain branches of farm or garden practice are often sent to the Library, and such information is always cheerfully furnished.

The general catalogue of the Library will be completed in the card form in the course of the next few years, and will doubtless be printed; it will be the most complete catalogue of agricultural literature ever issued, and will be of great value to workers in agricultural investigation.



[Reprinted from the Yearbook of the U. S. Department of Agriculture for 1895.]

A PIONEER IN AGRICULTURAL SCIENCE.

By W. P. CUTTER,
Librarian, U. S. Department of Agriculture.

AGRICULTURE IN COLONIAL VIRGINIA.

The existence of the colony of Virginia was dependent to a great extent on the cultivation of a single agricultural product, tobacco, which was not only the staple crop of the colony for nearly two centuries, but served as a medium of exchange and as the basis for governmental support by taxation. Soon after the founding of the Virginia settlements, a decree of the English King, James I, legitimized the tobacco trade, and every available piece of ground in the village of Jamestown was at once planted to tobacco. The enormous profits made by the planters attracted large numbers of settlers; new lands were cleared, and growing tobacco soon covered them.

The agriculture of colonial Virginia was extremely crude in character. The staple food crops were cultivated only to the extent necessary to provide food for the laborers employed in tobacco cultivation, which was the main end to which everything else was subordinated. Although the colony became very prosperous as a result of the enormous demand for tobacco and the comparatively slight cost of raising the crop, much of the depression which followed the war of the Revolution may be ascribed to the continuous growth of this one crop for such a long period of time. The operations of the farm were so similar in character from year to year that little attention was paid to the details of farm management by the planters themselves, who spent the major part of their time in the exercise of the rites of hospitality, even now so proverbial a characteristic of Virginians. The agricultural interests of the State suffered from this lethargy of the most intelligent of her citizens, being left in care of plantation overseers, who were often not much less ignorant than the slaves whose labors they superintended.

With the war of the Revolution came the interruptions to commerce incident to the struggle. The profits of tobacco culture being suddenly decreased, more attention was paid to the raising of other crops. With the outbreak of the French Revolution and the wars which followed, the demand for cereals became so great, the price rising in proportion, that every planter abandoned his tobacco fields to the cultivation of food stuffs; but the soil, although fertile in the beginning,

had so long been subjected to the exhausting demands of the tobacco crop that the yield of wheat was small.

In the early history of the colony, land was plentiful. When a field ceased to yield profitably, it was an easy matter to use the laboring force during the comparatively idle winter season in clearing new land for cultivation. A time came, however, when the land covered by the original forest was scarce, and the fertility once present had been reduced by exhaustive cropping. The great profits of the past had disappeared as a result of careless management. The demand for cereals decreased with the universal peace which succeeded the fall of Napoleon, and the planters of Virginia found themselves confronted by very depressing conditions; a period of comparative stagnation ensued. Some of the farmers had made attempts to introduce cotton cultivation without great success. Tobacco raising was confined to a large extent to the upland counties, where the land was less exhausted and where special methods of curing still made the crop a profitable one; but in the eastern and middle section there seemed to be no possible method of regaining the former prosperity. Many of the old Virginia families, attracted by the marvelous tales of the fertility of the newly settled prairies of the West, deserted their ancestral homes and sought new fields for their efforts. The price of land decreased, and taxes increased in consequence.

CHARACTERISTIC CONDITIONS AND INFLUENCES.

The general process of development in the United States was modified in the South by special influences. The institution of slavery had formed a distinct social system, the dominant class becoming a proud aristocracy. There was ample leisure for self-improvement, and the standard of culture was high. The standard works were widely read, and newspapers were abundant; a few magazines of great intellectual excellence but meager circulation were issued. Scant encouragement was given to those who chose the literary profession; men who were in the front rank of American novelists complained of neglect and lack of financial support. Yet, among the upper classes, education was not backward. There were no common schools, but excellent academies and colleges supplied their place. Little attention was paid to the sciences in the curriculum of these institutions, and technical education was absolutely undeveloped. The whole scheme of training was devised to make orators, who were to move the masses by the charm of the spoken word. The choice of a vocation was confined almost exclusively to the pulpit, the bar, and the forum, and on account of the great interest in politics the majority of the educated men preferred to expend their energies in political controversies.

The same conditions produced an equally noticeable effect on the material life of the community. There was little in the way of

manufacture or trade with other sections. The methods of transportation were extremely primitive, and the conservatism of the people created a serious opposition to the building of railways. Each planter had his own carriages, wagons, and carts, and a long trip to market was only a pleasant diversion, time being of slight value. As each plantation was an economic unit, very little was necessary in the way of trade. The commercial transactions were largely conducted by barter, and there was little necessity for ready money. Agriculture was the main pursuit, and its main staples—tobacco, cotton, and rice—were confined to this section. Although so much of the life of the community was devoted to agricultural pursuits, the operations of the farm were rarely conducted on business principles, or with any attention to the teachings of science. The planters could afford to take life easily. Their chief duties were to make long visits to relatives and friends, to ride, fish, and hunt, and, above all, to discuss the affairs of state.

EDMUND RUFFIN.

It was under such conditions as these that Edmund Ruffin lived. He recognized the difficulties inherent in his times, and was not discouraged by the conservatism against which he labored, being a man of independence and great firmness of purpose.

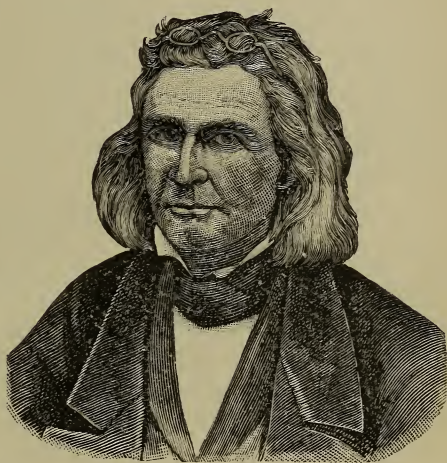


FIG. 123.—Edmund Ruffin.

Edmund Ruffin was born January 5, 1794, on his father's plantation in Prince George County, Va. His father was a gentleman of fortune, a typical planter of the olden time. From his earliest youth Edmund was an intelligent reader of the literature of the day, although his reading was rather for amusement than for instruction. As was the custom, his father decided to give him the education due him as the son of a wealthy Virginia gentleman, and with this end in view sent him at the age of 16 to William and Mary College. The change from the quiet life on the plantation to the excitement at college was evidently not the best thing for the young planter, for, after an unprofitable connection with the institution, he finally left under unpleasant circumstances.

At this time the war of 1812 broke out, and he enlisted in a volunteer company, serving from August, 1812, to February, 1813. He left

the army probably on account of his father's death, which must have taken place at about this time, for in the year 1813 we find him placed in the possession of an extensive estate at Coggins Point, in Prince George County, and he states that, although not of legal age, the "easy indulgence of his guardian" gave him the control of this property.

We must sympathize with Mr. Ruffin in the difficulties under which he labored in his early efforts to make a success of agricultural operations on his estate. He had gained no practical knowledge of the field work of agriculture in his youth, and he had therefore to learn the most rudimentary principles. Yet the farm operations were so simple in his day that he soon mastered their details. In his reading he chose rather the agricultural writings of the time. These were mostly planned to satisfy other conditions, such as existed on the great estates of England, and much of their teaching was inapplicable to the conditions existing in Virginia. But the perusal of these works gave him an insight into the scientific methods used in other countries, which offered a sharp contrast to the slipshod methods in vogue in his own State. He saw that the latter were "wretched in execution and erroneous in system."

EFFORTS TO INCREASE THE FERTILITY OF THE SOIL.

In the same year in which he began his control of the estate there appeared the first book devoted to the discussion of Virginia agriculture. This work, written by Col. John Taylor, a prominent planter of Caroline County, was printed in Georgetown, D. C., in 1813, under the title, "Arator: being a series of Agricultural Essays, Practical and Political * * * by a Citizen of Virginia." It had previously been published as a series of articles in the "Spirit of Seventy-six," in 1809 or 1810. The work at once attained great popularity, and was issued in at least six editions. Colonel Taylor's views may be summarized briefly as follows: The secret of success in agriculture lies in the free use of putrescent vegetable matter as a manure. In the ordinary process of handling such materials as are used for this purpose, much of the valuable fertilizing material is lost, being of a gaseous nature and passing off into the atmosphere during the process of putrefaction. The manures should be, therefore, incorporated with the soil before the processes of decay are started, so that this valuable matter may be saved. Too much land is used for grazing. This land should be used rather for the cultivation of crops, and the crops fed to the cattle at once (the modern soiling system). The manure made by the cattle should be at once plowed under, together with the waste from the fodder. Clovers should be largely grown and plowed under to add fertility to the soil. Gypsum will increase the clover yield. Deep plowing should be the rule.

It was natural that Mr. Ruffin should at once become an admirer

of Taylor's system of husbandry. He recognized the fact that the exhaustion of the fertility of the soil was the great difficulty with which he had to contend, and welcomed any system calculated to improve it in this respect; but he at once met with difficulties in the attempt to apply the principles to his own practice. His land was not suited to clover, and he found it impossible to get a crop. The soil was shallow, and the ridge system advocated by Taylor subjected the sidehills to injurious loss from washing. Nor did the land respond to the use of vegetable manures to the extent expected. After six years spent in the attempt to apply these principles, meeting with nothing but failure, he was compelled to confess that "no part of my poor land was more productive than when my labors commenced, and on much of it a tenfold increase had been made of the previously large space of galled and gullied hillside."

At this time Mr. Ruffin had an opportunity of examining a copy of Sir Humphrey Davy's Lectures on Agricultural Chemistry, and naturally sought for a reason for the lack of effect of "putrescent manures" in his particular region. He found the following passages:

If on washing a sterile soil it is found to contain the salts of iron or any acid matter, it may be ameliorated by the application of quicklime.

A soil of good apparent texture from Lincolnshire was put into my hands by Sir Joseph Banks as remarkable for sterility. On examining it I found that it contained sulphate of iron, and I offered the obvious remedy of top-dressing with lime, which converts the sulphate into a manure. [Ed. 2, London, 1814, p. 203.]

Mr. Ruffin at once saw a parallel between the soil mentioned by Davy and that of his own farm. He tested the soil for the salts of iron, but could not detect a trace of the copperas which he expected to find. In studying over the matter he was attracted by the expression in the first sentence, "if it is found to contain the salts of iron or any acid matter." While he recognized the intention of Davy to refer to the mineral acids only, which he knew by direct testing to be absent from the soil of his farm, he conceived the idea that the sterility might be due to the presence of organic acids in the soil, which acted as a "poison" to the crops. This view was partially confirmed by the character of the vegetation on the worn-out land in question, which consisted largely of sheep sorrel and similar plants known to contain free vegetable acid. He noticed also that those portions of his land did not respond to a test for lime. His more fertile soils, however, were "shelly" in character, and there was no trace of the acid plants growing on them. He could not, however, obtain any evidence of a direct nature that the vegetable acids were present in the sterile soils, nor in his extensive reading could he find a single mention of the occurrence of these substances in any soil. The existence of the vegetable or humus acids was not proved until a much later date.

From these meager indications Mr. Ruffin drew his theory of the action of lime on the soil, and at once proceeded to put his ideas into

practice. He found on his own farm extensive beds of shell marl and decided to use this material, which was cheap and easily accessible in unlimited quantities. The existence of these beds had been well recognized, and a large amount had been burnt into lime for structural purposes.

Lime in the form of quicklime, limestone, marl, etc., had been used on the continent of Europe for many centuries. There are several instances of earlier use of marl in America, and in the State of Pennsylvania the use of quicklime had become almost universal. In none of these instances, however, had lime or marl been used with a definite object in view, or with any other purpose than the general improvement of the land; nor had any experiments been made except in the application of the lime and a guess or inaccurate statement of the increase in yield.

EXPERIMENTS IN THE USE OF MARL.

Mr. Ruffin began his experiments with marl in February, 1818, excavating a large amount of the mineral and applying it to a portion of a tract of land which had just been cleared of forest growth. The application was made at the rate of 150 to 200 bushels to the acre. From the land thus treated he obtained an increase of 40 per cent over the crop on similar land untreated. Encouraged by this result, he planned more extensive experiments for future years. Without entering into the details of these trials, the result may be stated as overwhelmingly in favor of the use of marl; in some instances the crop from the marled fields was more than twice as great as from the same fields before marling.

It is not to be understood that Mr. Ruffin advocated the use of marl alone with the expectation of thus building up the fertility of the soil. His object was rather to bring the soil into such condition as would make it respond to an application of organic manures which had been previously found to be of little value when used on the land in its ordinary condition. He retained as much of the teachings of Taylor as placed great stress on the value of vegetable manures, and used every effort to add as much organic matter as possible to the soil on his farm.

The experiments were continued for a long series of years, accurate records being kept of the history of each plat of ground, frequent comparisons being made between the measured yields of marled and unmarled fields. Marl was tried with and without manure, and manure was tried with and without marl. The greater the number of experiments and the more numerous the results obtained the greater proof was given that the use of marl was of great advantage. The careful manner in which the experiments were carried on shows him to rank as one of the most intelligent experimenters of his time. The investigations were not confined to mere field trials. The soil of

his plantation was analyzed, the marls used were analyzed, and the results were carefully studied. He searched the literature of every age for mention of the occurrence of marl and the history of its application to the purposes of agriculture. He was familiar with foreign publications on the subject, not only reading thoroughly, but studying, comparing, and making extracts as he found matter worthy of future reexamination. He collected information as to the character and extent of deposits of calcareous substances in his native State, and devoted much time to a study of the best and most economical methods for its exploitation. He figured carefully the cost of applying the marl, and estimated the financial returns from its use. Every line of inquiry which could possibly add to his general stock of information was carefully followed to the very end.

HOW MARL INCREASES FERTILITY OF SOIL.

His reasons for the use of marl, gained from his experience and study, were two in number. He believed that the addition of marl corrected the natural acidity of the soil, and that it assisted in the preservation of organic manures from loss of the gaseous products of decomposition while hastening the decomposition itself. He foreshadowed to a great degree the discoveries of later years with reference to the action of soil bacteria; for, as is now well known, certain of the nitrifying organisms in the soil are capable of action only in neutral or alkaline soils, and thrive best in the presence of a small amount of alkali. The sterility of many of the soils in eastern Virginia was probably due to conditions present which are unfavorable to the growth of the nitrifying organisms, owing to the presence of organic acids in the soil. The richest soils in the world contain large quantities of organic matter, and probably some proportion of the humic (organic) acids; but they also contain sufficient lime to unite with these acids, and thus neutralize them to a large extent.

The marls first used by Mr. Ruffin were valuable only from their content of lime, no phosphoric acid or potash being present; but later, and especially after his removal to his estate at Marlbourne, in Hanover County, he used greensand, called by him "gypseous earth," which contained certain amounts of potash, and probably also contained phosphoric acid. He does not seem to have recognized the value of these ingredients, basing his opinion of the value of these marls on the carbonate of lime contained. We can hardly overlook this mistake, although it was excusable at a time when the knowledge of agricultural chemistry was extremely limited.

The first published article from Mr. Ruffin's pen was "An essay on calcareous manures," in the *American Farmer*, Vol. III, p. 313 (the number for December 28, 1821). This essay had been prepared and read before a meeting of the Prince George Agricultural Society, of which Ruffin was a member. The essay was afterwards published

in book form, reaching its fifth edition in 1852. From a short article of 7 pages it expanded to a book of 493 pages. It is probably the most thorough piece of work on a special agricultural subject ever published in English. The treatment of the subject is historical, scientific, and practical, exhausting every source of information available. From the first publication, this essay attracted great attention, and is even now the best authority on certain phases of the subject. As a result of this and other publications by the same author, a large proportion of the farm owners in the tide-water district of Virginia were led to use marl, and, what is more important, were aroused by his example to a sense of the importance of personal attention to the needs of their estates and to details of management. At the time of the publication of the fifth edition of the essay, the effect of his teachings was so plainly evident that attention was called to the matter by the governor of the State in his annual message to the legislature in the following words:

The increased value of the lands lying in the tide-water district, as exhibited by the returns of the recent assessment, vindicates the science [of agriculture], and appeals strongly to you for aid and encouragement in its behalf. In 1819 the lands in this district were valued in the aggregate at the sum of \$71,496,997, and in 1838 at \$60,704,053.20, exhibiting a decrease in value during the nineteen years that intervened to the enormous amount of \$10,792,943.80. And yet these same lands were recently assessed at the sum of \$77,964,574.52, showing an increase in their value during the last twelve years of \$17,260,521.32.

This remarkable and gratifying change in the value of these lands can not be attributed to any extent to benefits resulting from the works of internal improvement, for thus far these improvements have been chiefly confined to other sections of the State. And in vain do we look for a solution of this problem, unless we remember that for several years past the enterprising citizens of this section of the State have been devoting themselves to the subject of agricultural improvement; and by the proper application of compost, marl, and other manures, and the use of other means which a knowledge of this branch of education has placed at their command, they have redeemed, and made productive and valuable, lands heretofore worn out by an improper mode of cultivation, and consequently abandoned by the farmer as worthless and unfit for agricultural purposes.

FARMERS' REGISTER.

Early in the year 1833 Mr. Ruffin issued, as editor and proprietor, the first number of the *Farmers' Register*, a monthly agricultural magazine of 64 pages of reading matter. In the editorial column of the first number, after calling attention to the low state of agriculture in Virginia, and discussing the reasons for the same, he announces that the journal is started to serve as a medium of exchange between the farmers of the State, and that this shall be the chief feature. The *Farmers' Register* was published for ten years, the second volume being printed on the estate of Mr. Ruffin at Marlbourne (Shellbanks); the subscription price was \$5. The influence of this journal on the agriculture of the State was very great, the tone was high, and the articles were carefully written, or selected from the better class of

agricultural publications. Nearly half of the reading matter came from Mr. Ruffin's pen, and the subjects on which he expressed himself were extremely diverse in character.

Although much of the matter published in the Farmers' Register had a direct bearing on the marl question, nearly every issue containing something on the editor's favorite hobby, yet it was not by any means the only subject discussed. Every conceivable question in which the farmers of the State might be interested, or which could affect their welfare in the least, was carefully treated. Much attention was given to the development of roads and railways in the State. Much was written on the slavery question. Agricultural education was discussed at length. But the operations of a practical character, the field work of the farmer, received the greatest attention.

The difficulties attending the publication of such a paper at this period were at best discouraging. Mr. Ruffin complains with reason of the delay in the delivery of his paper, which in one instance required fourteen days to reach a subscriber at a distance of 180 miles. The first volume was printed on poor paper, although it is now in far better condition than can be hoped for a copy of the ordinary agricultural paper of to-day at the end of a similar period. He suffered from the delinquent subscriber, and from the subscriber who thought that the price should be reduced. He attempted, as has already been stated, to print the paper on his estate in Hanover County, but probably found the task too great, as the third and subsequent volumes were printed at Petersburg.

As appendixes to the Farmers' Register were printed the seventh edition of Arator, in 1840, the Westover Manuscripts, in 1841-42, and the third edition of the Essay on Calcareous Manures, in 1842. This was done to insure the wide distribution of these works, and incidentally to save cost of transmission.

PUBLIC SERVICES OF MR. RUFFIN.

At the meeting of the legislature of the State in 1841, a State board of agriculture was organized and Mr. Ruffin was elected a member; in December of that year he was selected secretary and held that position for a year. In 1842, the State of South Carolina having made an appropriation for an agricultural surveyor, Mr. Ruffin accepted the position and published, in the following year, his first report, being mostly a statement of the occurrence of beds of marl in the State and a plea for the drainage and reclamation of the swamp lands. On his return to Virginia he was instrumental in founding the Virginia State Agricultural Society and was elected the first president. He advocated, with others, the establishment of a State commissioner of agriculture, with a good salary, and the right to employ certain scientific assistants, but the plan did not meet with the approval of the legislature. At various periods during his life he was connected with

local agricultural societies, and by his earnestness and enthusiasm aroused much interest in cooperative work.

Mr. Ruffin was an enthusiastic advocate of higher education, suggesting the establishment of an agricultural college supported by the State. In the main, the details of his plan were such as are in operation in the agricultural colleges of the present, except that the students might pay all their expenses by work in the experimental fields connected with the college. The experience of past years has shown this to be impossible. An essay on the subject of agricultural education, published at Richmond in 1853, won a prize offered by the State Agricultural Society.

As was usual with the prominent men of Virginia, Mr. Ruffin took great interest in the political affairs of his native State. In 1824 he was elected to the senate of Virginia, and served three years. In 1841 he published *Observations on the Abuses of the Banking System*, and in the following year at least six numbers of a periodical publication under the name *Bank Reformer*. These works were called forth by the financial agitation of the time.

In 1855 a collection of the more important agricultural writings of Mr. Ruffin, previously published in various periodicals, were gathered together in *Essays and Notes on Agriculture*. This included an essay on drainage, a prize essay on the Southern cowpea, a discussion of remedies for malaria, and articles on the culture and uses of clover, method of harvesting wheat, the moth weevil, prairies, deserts, peat bogs, usefulness of snakes. This list illustrates the versatility of the man, but can give no idea of the real value of each article or the concise and easy style of the author.

The good resulting from the agricultural teachings of this man would to-day be more evident had not the war left the State of Virginia in a very depressed condition. The use of marl, once so common, has been displaced to a large extent by commercial fertilizers. The cheap slave labor made it possible to obtain marl at slight cost; it does not now pay to carry it to any distance. Most of the men whose energies were spurred to new effort by his ready pen have passed away; but among the intelligent farmers of the State he is still remembered, and his teachings are often followed by those who have never heard his name nor read what he has written.

Edmund Ruffin conducted his experiments with such attention to details and with such a truly scientific method of preparation and planning that we may look on his work as some of the best done in the country. He certainly was ahead of the investigators of the day. He proved by experimentation not only that the practice of the farmer is often ahead of the proof of the theorist, but that the work of the theorist is often of great practical benefit to the farmer.

